

# NASA TECH BRIEF

## *Lyndon B. Johnson Space Center*



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### Preservation of Flavor in Freeze Dried Green Beans

#### The problem;

Freeze drying of fresh and frozen vegetables usually alters their quality and characteristics.

#### The solution:

A treatment prior to freeze drying was developed for green beans which preserves their flavor and texture during rehydration.

#### How it's done:

The method utilizes thermostabilized green beans, i.e., beans heated to the point at which their cell structure is altered. Beans freeze dried with this altered cell structure exhibit improved rehydration properties and retain their flavor and texture.

In this process, thermostabilized green beans are first drained on a screen to remove excess liquid, the beans are then placed on stainless-steel plates and put into a freezer and frozen to  $-17\pm 3^{\circ}\text{C}$ . The beans are then removed from the freezer and freeze dried in a freeze drying chamber. The chamber pressure is maintained below 2.0 mm Hg during the drying cycle. During the drying process, two platens, one located approximately 4 cm above the bean tray and the bottom one 2 cm below, are maintained at a temperature of  $52^{\circ}\text{C}$ . After freeze drying, the beans are removed from the chamber and packaged in polyethylene packages. The product can be completely rehydrated with water at  $66^{\circ}\text{C}$

in 3 minutes by use of 4.2 ml (4.1 g) of water to 1.0 g of dehydrated beans. The rehydrated beans retain excellent color, texture, and flavor.

#### Note:

No additional documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer  
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Code JM7  
Houston, Texas 77058  
Reference: B73-10092

#### Patent status:

Inquiries concerning rights for the commercial use of this invention should be addressed to:

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